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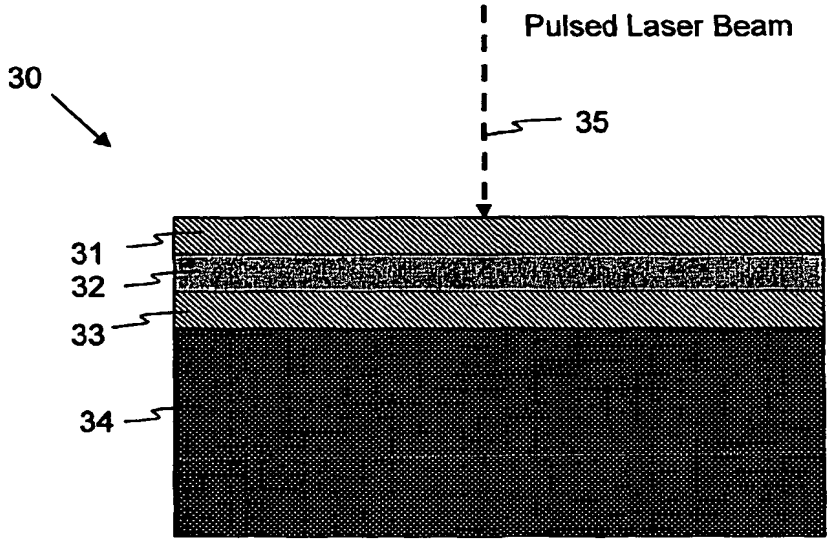
[Continued on next page]

(54) Title: LASER MACHINING



(57) Abstract: A substrate (30) is diced using a program-controlled pulsed laser beam (35) apparatus having an associated memory for storing a laser cutting strategy file. The file contains selected combinations of pulse rate Δt, pulse energy density E and pulse spatial overlap to machine a single layer or different types of material in different layers (31, 32, 33, 34) of the substrate while restricting damage to the layers and maximising machining rate to produce die having predetermined die strength and yield. The file also contains data relating to the number of scans necessary using a selected combination to cut through a corresponding layer. The substrate is diced using the selected combinations. Gas handling equipment for inert or active gas may be provided for preventing or inducing chemical reactions at the substrate prior to, during or after dicing.

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/66 B23K26/08 B23K26/40 B23K26/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 72224 A (DUIGNAN MICHAEL T ;POTOMAC PHOTONICS INC (US)) 30 November 2000 (2000-11-30)	33, 37-41,50
A	page 5, line 17 - line 22 page 8, line 8 - line 26 page 12, line 1 -page 13, line 20 page 15, line 12 - line 20 page 20, line 22 -page 21, line 2 page 23, line 25 -page 24, line 11 page 31, line 25 -page 32, line 5 page 33, line 19 -page 35, line 8 page 39, line 8 -page 40, line 16 page 45, line 14 - line 16 page 46, line 18 -page 47, line 1; claims 1,3,13,16,17; figures 1-5,8-10,12 -/--	1,4,5,9, 12,15, 16, 18-20, 23,34,51

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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